



*Reid  
10/2/67*

**BELL UH-1D TACTICAL TRANSPORT HELICOPTER**



# UH-1D INTRODUCTION







## AND BACKGROUND

The UH-1D Iroquois is the most advanced, modern utility tactical transport helicopter available in the world today. Entering production in May 1963, the Delta is the latest of a proven family of UH-1 helicopters serving the armed forces of 18 countries around the globe. The Delta's high performance has enabled it to set 21 world rotorplane records... more than any tactical aircraft has ever held.

The ability of the UH-1 to successfully carry out combat missions has been proven repeatedly in Vietnam. Its rugged construction and versatility have made the "Huey" ideal for missions that range from evacuating casualties and rescuing downed fliers, to transporting troops or cargo into the combat zone, to providing close fire support with a wide selection of weapons packages and ordnance.

The UH-1D has seating capacity for 15 personnel, including crew. It requires a minimum of maintenance and logistic support in the field. Various types of armament such as rockets, missiles, machine guns, etc. can be quickly mounted on standard hardpoints for fire support missions. Bell's UH-1D is designed to conform to the requirements of a wide spectrum of military missions in all extremes of climate and environment.

### UH-1A

- First Production Delivery — June 1959
- Medical Evacuation Missions — U. S. Army
- 7 Place, 770 Horsepower



### UH-1B

- First Production Delivery — March 1961
- Utility and Armed Escort Missions — U. S. Army
- 9 Place, 1100 Horsepower



### UH-1E

- First Production Delivery — March 1963
- Assault Support and Rescue Missions — U. S. Marine Corps
- 9 Place, 1100 Horsepower



### UH-1F

- First Production Delivery — February 1964
- Utility and Missile Site Support Missions — U. S. Air Force
- 11 Place, 1100-1325 Horsepower







## ENVIRONMENTALLY

Over 20,000 hours of rigorous test flight have been accumulated by the UH-1. Test programs include performance, environmental and service evaluations by the U. S. Army, Air Force and Navy and F.A.A. as well as the military services of several other nations.

The Iroquois development test program was the most thorough ever undertaken for a helicopter, the UH-1 completing all tests successfully.

Adaptable to all extremes of climate, the UH-1 has over 800,000 hours of flight time accumulated in every environment. Approximately 50,000 hours are added monthly.

Grueling desert operations conducted in 120 degree heat and swirling sand have proven all moving parts of the helicopter extremely





# TESTED AND PROVEN

reliable and erosion resistant. At the other extreme, extensive Alaskan, Arctic, and Antarctic operations have shown the UH-1 to be equally reliable for extended operations in snow and sub-zero temperatures where its quick starting turbine engine eliminates the need for warm-up time.

Shipboard operations on the open sea and tropical operation in areas such as Vietnam have demonstrated the UH-1's ability to operate efficiently in humid, damp climates.

In the thin air of the Italian Alps, Himalayas and mountainous areas of Ethiopia and South America, the "Huey" has demonstrated its high-lift rotor and ease of control. The UH-1D is the most thoroughly proven aircraft in active military service today.







*Evacuate 6 litter patients or transport 13 troops*



*Rescue in inaccessible area with portable hoist*



# UH-1D

# DESIGNED FOR

Mission flexibility was designed into the Delta. It can be quickly adapted to carry out a wide variety of military helicopter missions.

Slide open the wide cargo door and load 13 troops/passengers — or 6 litters plus medical attendant.

Up to two tons of cargo can be carried internally or externally with seats folded or removed. For long endurance missions, a variety of auxiliary fuel kits are available which can be added in combination

**Designed for rugged, sustained military field operations, the Delta features:**

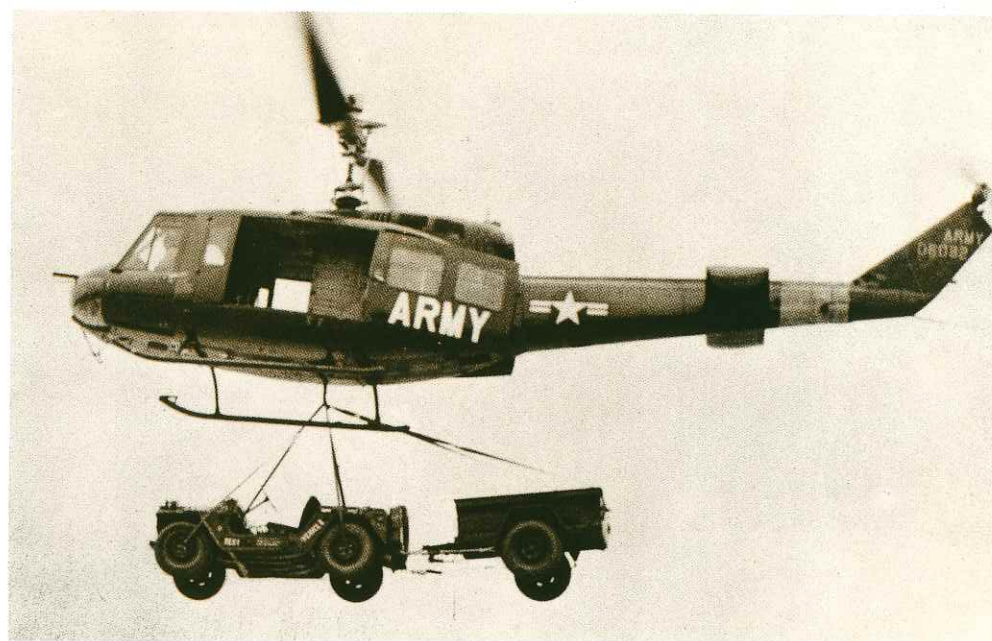
- Skid Gear for all terrain operation
- Simple two-bladed rotor — no folding
- Minimum size and weight — easy to conceal
- Low silhouette for minimum vulnerability
- Can provide own suppressive fire
- Wide sliding doors for full use of cargo compartment
- Knee-high deck—no steps or ladders for troops to climb
- Safe rotor clearance
- Good visibility — troops oriented before debarking
- Stable flight minimizes pilot fatigue



# MISSION FLEXIBILITY

with seating and litter arrangements. For search and rescue missions, a portable internal hoist of 600 pounds capacity can be installed in addition to seats and/or litters. This arrangement enables the Delta to perform 7-hour search and rescue missions.

Tri-Service acceptance by the United States and by the Federal Republic of Germany is attributed to the mission flexibility of the Bell UH-1.



*Unique single point center of gravity attachment permits smooth flight with up to 4,000 pounds of external load.*



*Hawk missile component can be through loaded*



*Troop-carrying UH-1D has own suppressive fire*

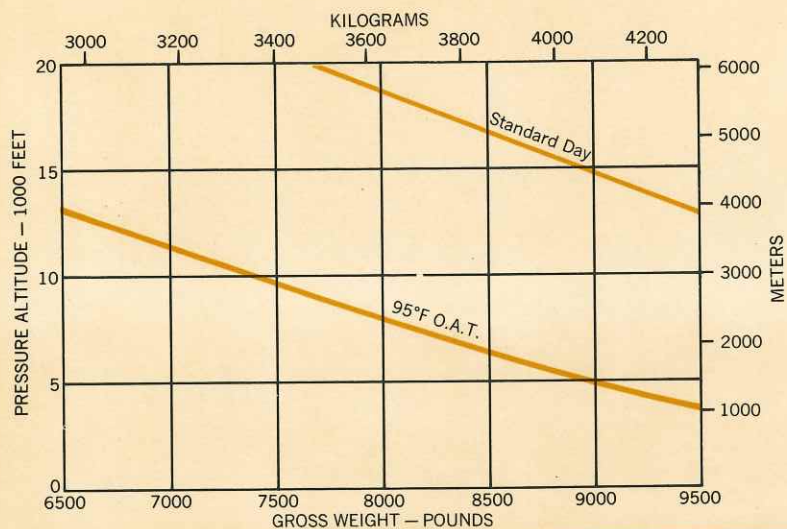


*Transport in C-124, C-130 (shown) and C-133 aircraft with minimum disassembly*

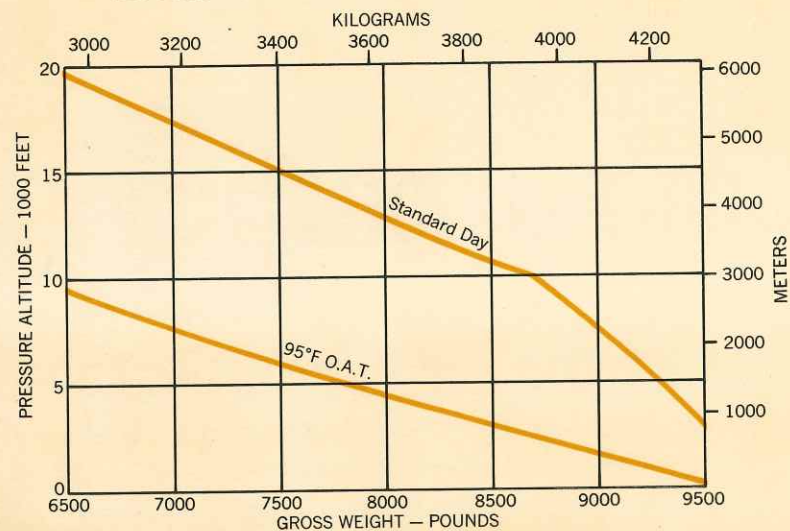


*Fire fighting/crash rescue attributes to mission flexibility*

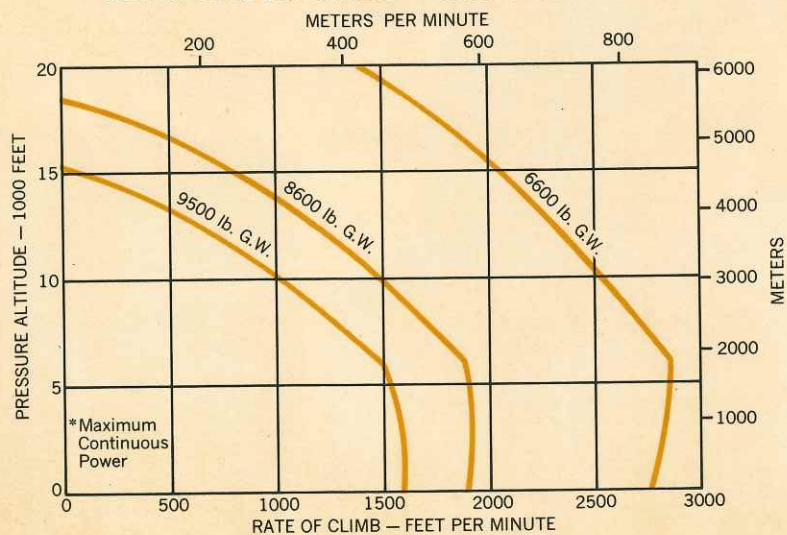
### HOVERING CEILING — IN GROUND EFFECT



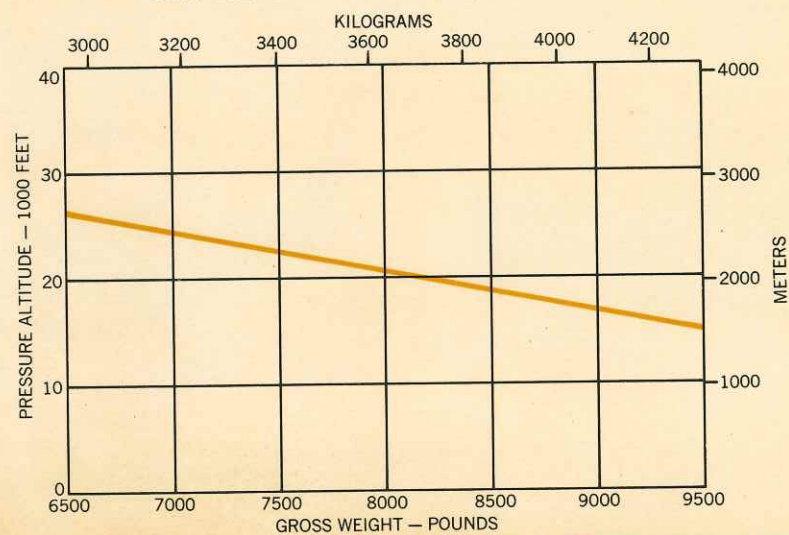
### HOVERING CEILING — OUT OF GROUND EFFECT



### CLIMB PERFORMANCE\* — ICAO STANDARD DAY



### SERVICE CEILING — ICAO STANDARD DAY

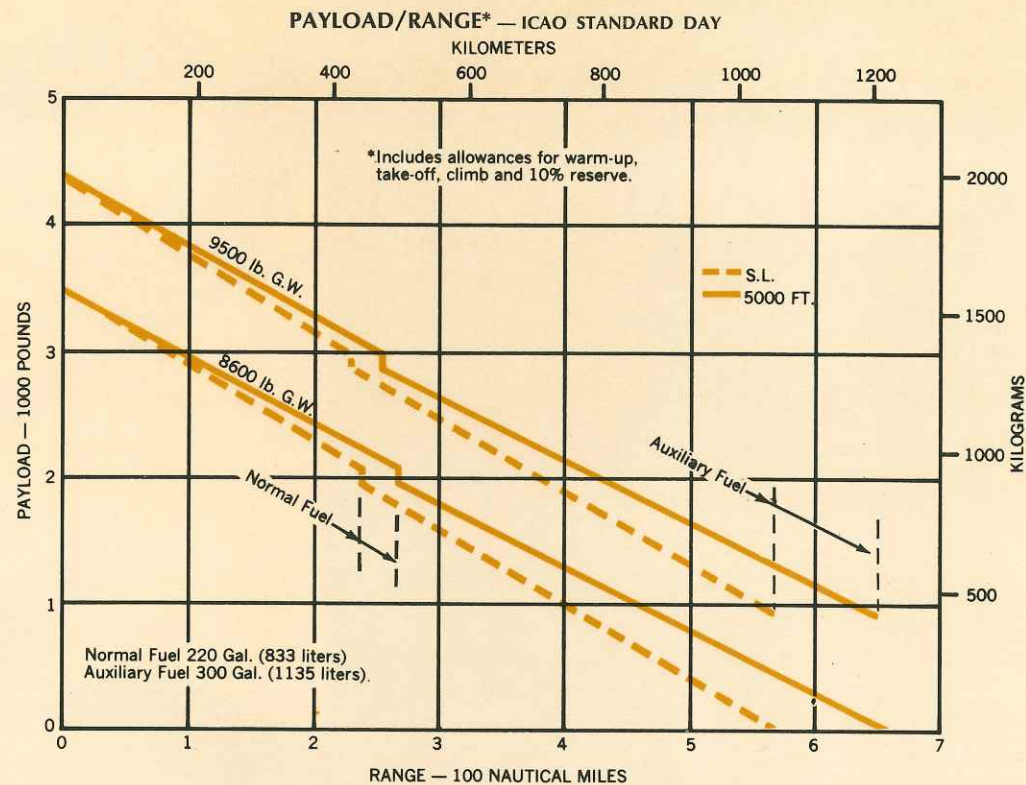




# UH-1D

## PERFORMANCE

T53-L-13 Engine  
(1400 SHP)



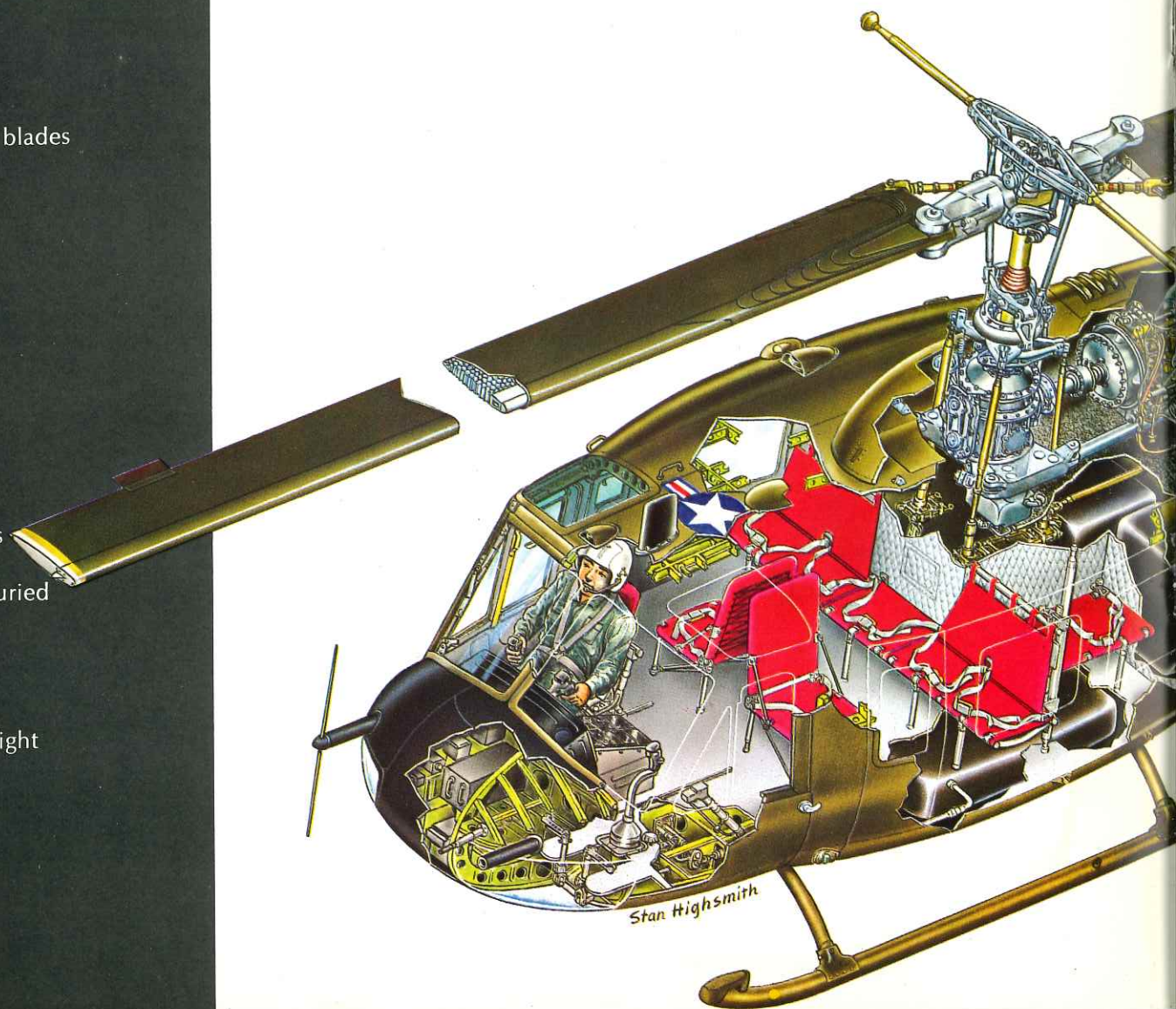
### ■ WEIGHT SUMMARY

	Pounds	Kilograms
Empty Weight .....	4790	2173
Fluids and Equipment .....	131	59
Oil .....	24	11
Pilot .....	200	91
Operating Weight .....	5145	2334
Fuel and Payload .....	4355	1975
Take Off Gross Weight .....	9500	4309

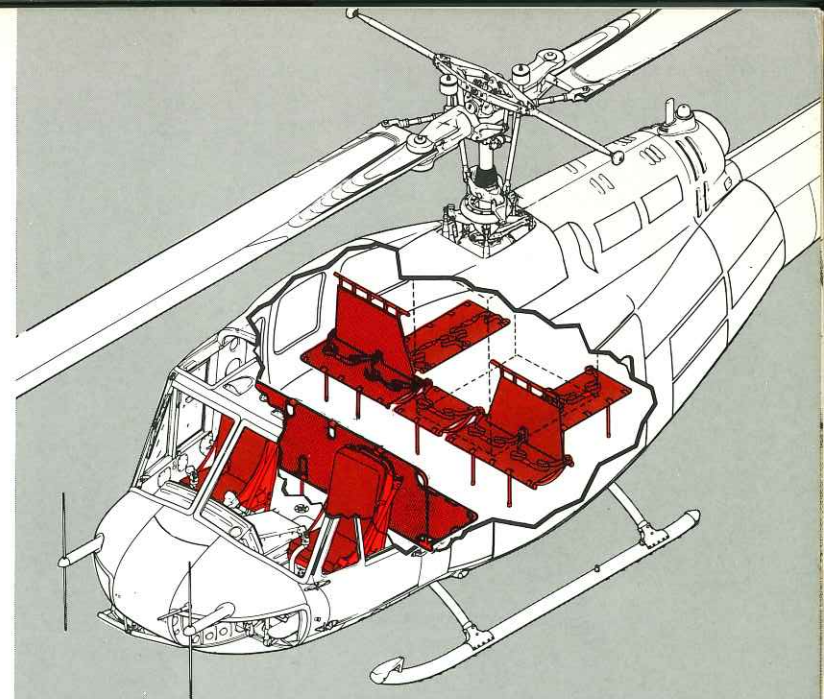
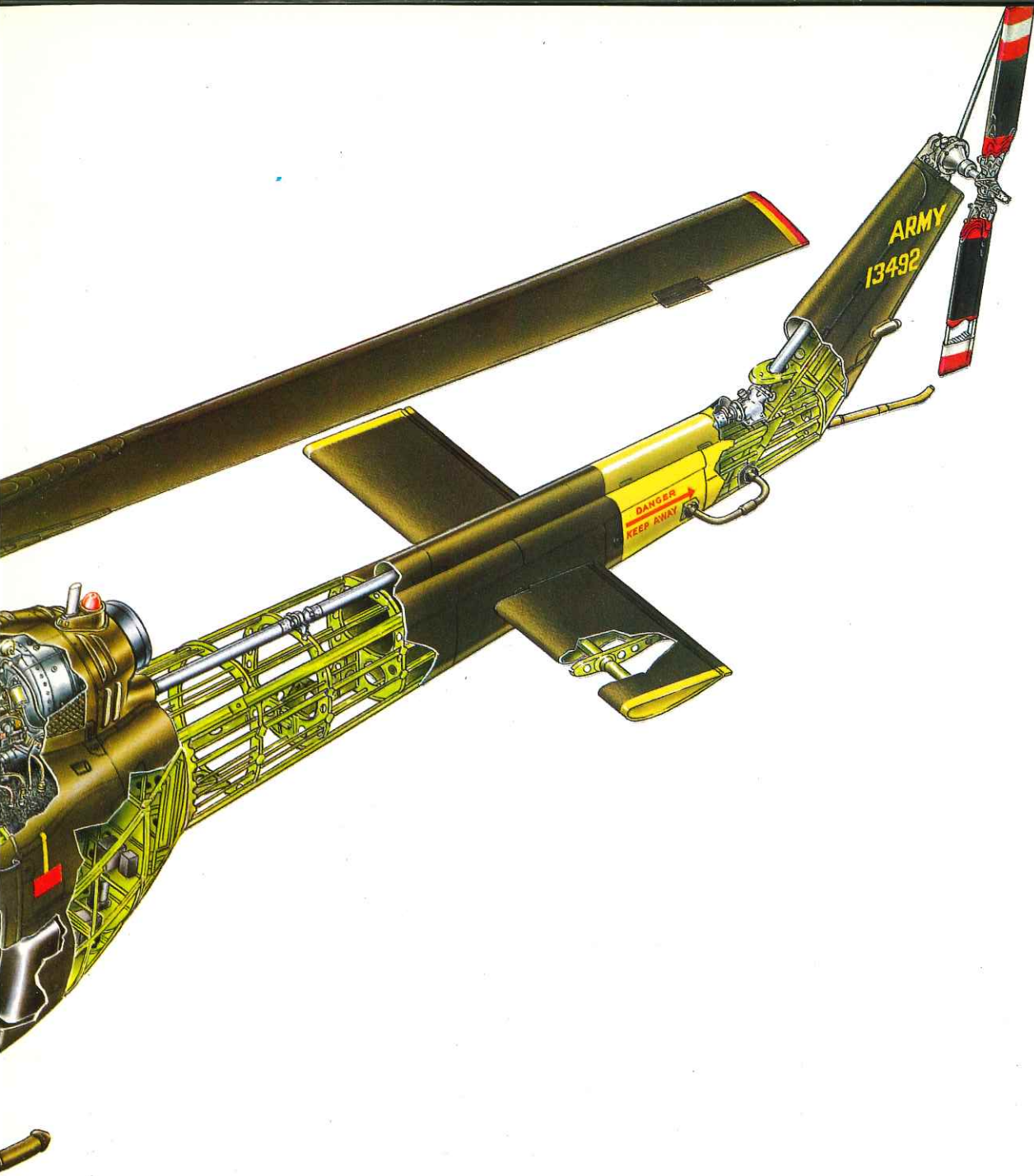


# UH-1D DESIGN CHARACTERISTICS

- Two-bladed, semi-rigid rotor with all-metal blades
  - High inertia rotor for safety
  - No starting/stopping wind limitations
  - No susceptibility to ground resonance
- Simplified rotor hub and stabilizer bar
  - Inherent mechanical stability
  - Permits hands-off flight
- Two stage planetary transmission
- T53 free turbine — quick change installation
- Interchangeable tail rotor drive shaft sections
- Dynamics and electronic components not buried in airframe
- Controls boosted and with "force trim"
- Dual instrument panel — qualified for IFR flight
- Good cabin heating and ventilation system
- Self-sealing fuel tanks

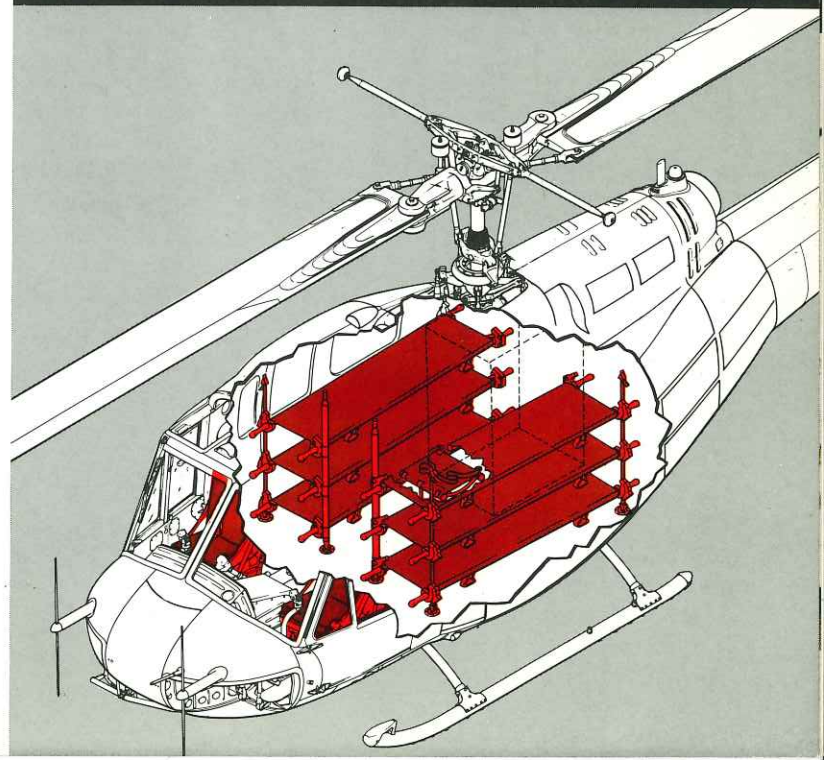






*From 2 to 15 seats can be installed using quick disconnect fittings in a variety of arrangements.*

*One to six litters for various combinations of stretchers and ambulatory patients can be installed in minutes.*







# SPECIFICATIONS

## UH-1D

### ■ UH-1D DIMENSIONS

Rotor diameter . . . . . 48 feet  
 Length, fuselage . . . . . 41 feet 11 inches  
 Length overall-rotor blades,  
   fore and aft . . . . . 57 feet 1 inch  
 Width (tread) . . . . . 8 feet 7 inches  
 Height to top of tail rotor . . . . 14 feet 6 inches

### ■ GENERAL DATA

Crew . . . . . 2  
 Passengers . . . . . 13  
 Engine — Single Gas Turbine — T53-L-11 (1100  
   SHP) or T53-L-13 (1400 SHP)  
 Normal fuel capacity . . . . . 220 gallons  
 Cargo compartment . . . . . 220 cubic feet

### ■ UH-1D WEIGHTS

Maximum gross weight . . . . . 9500 pounds  
 Empty Weight (with T-53-L-13) . . 4790 pounds  
 Useful Load . . . . . 4710 pounds



# UH-1D EASY MAINTENANCE

Easy maintainability was designed into the UH-1D and ratios of 1.5 maintenance hours per flight hour have been realized.

## SIMPLICITY

- Simplified Two-Bladed Rotor
- Rotor Stays in Track
- Minimum Special Tools Required
- Visual Sight Gages in All Fluid Reservoirs
- Oil Lubricated Bearings
- Interchangeable Parts
- Easy Accessibility

## SERVICING

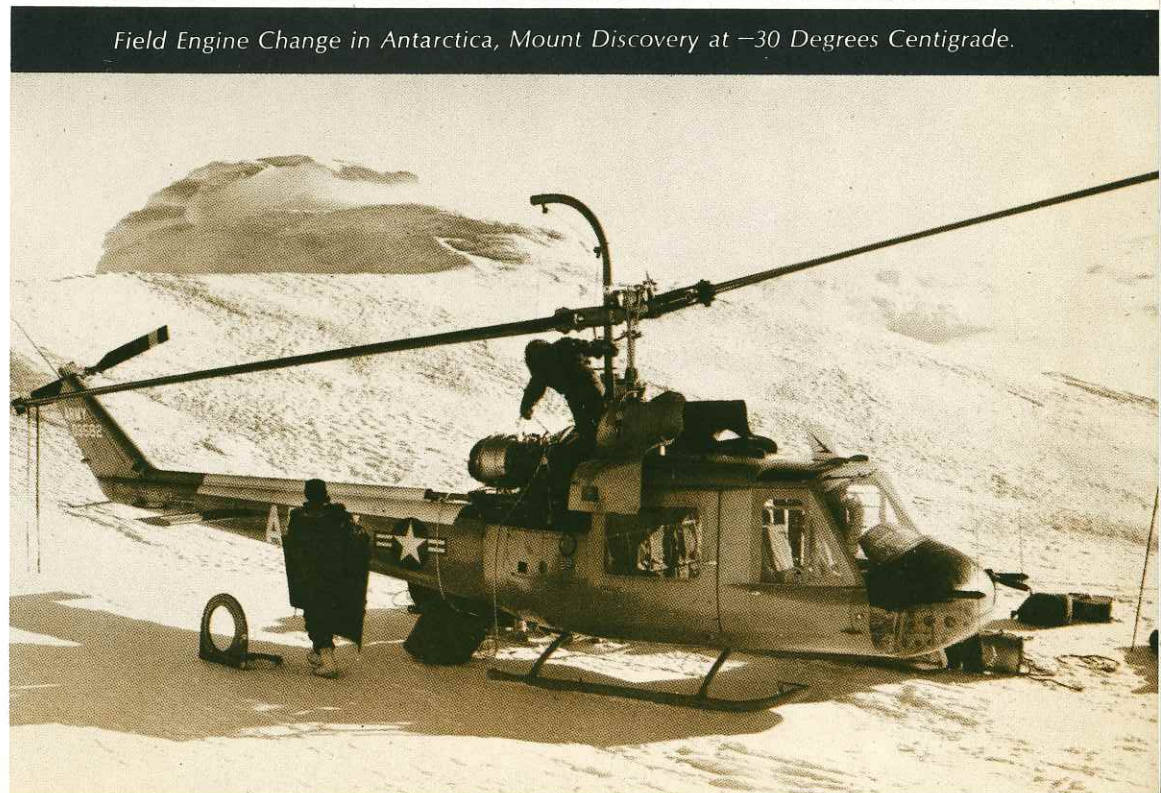
- Quick Opening Hinged Cowling
- Integral Work Platforms
- Quick Disconnect Fittings
- Plug-In Hoist for Component Replacement
- Quick Change of all Components
- Example: Engine Change in One Man Hour

## SELF-SUFFICIENCY

- Self-Contained Battery Starting
- No Auxiliary Power Unit Required
- Qualified for Operations from Minus 65°F to Plus 125°F

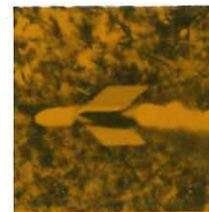


*Delta Has Complete Access for Inspection of All Systems.*

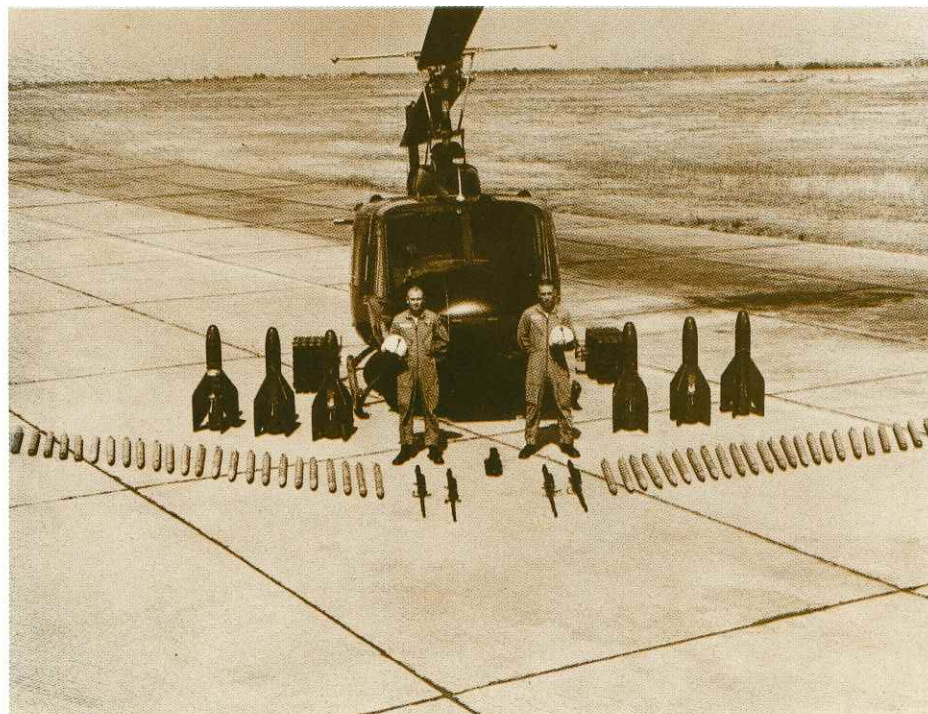


*Field Engine Change in Antarctica, Mount Discovery at -30 Degrees Centigrade.*





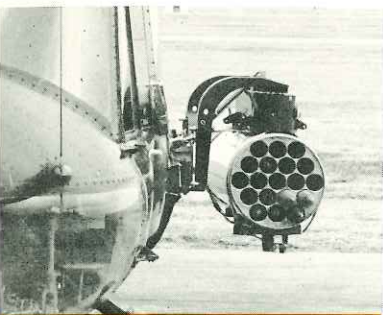
## ARMAMENT



The excellent stability and control characteristics of the UH-1D, combined with a wide variety of armament subsystems, make it the most versatile tactical helicopter in production today.

A mixture of ordnance loads can be carried, enabling the Delta to handle both hard and soft targets without returning to base. Hard point fittings are located both forward and aft permitting selective mountings of external stores. Quick disconnect wiring and fuel line plugs are also incorporated for quick attachment of the desired systems.

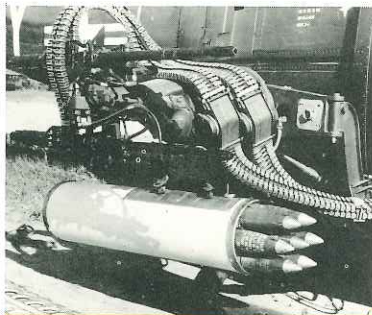




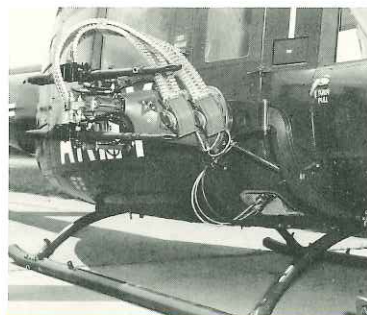
The low-drag LAU3A 2.75" rocket pod carries 19 rockets without sacrificing speed.



The XM14 50 caliber machine gun installation provides more standoff capability.



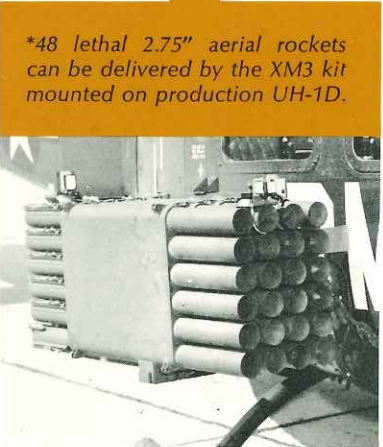
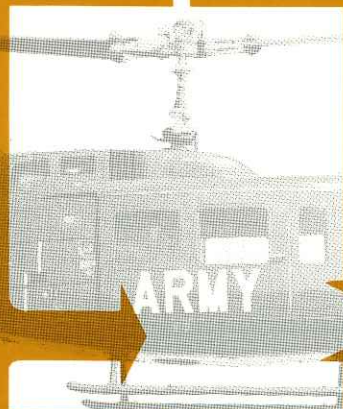
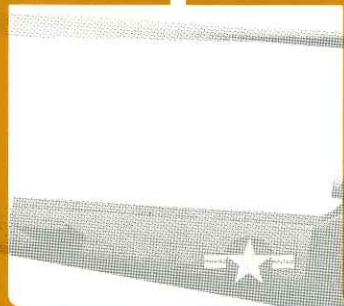
Developed through field experience in Vietnam, the XM16 combines 2.75" rocket pods with the flexible M6 quad gun kit.



\*The M6 flexible quad machine guns provide the troop carrying Delta with its own suppressive fire.



The M5 40mm nose turret grenade launcher provides effective anti-personnel fires.



\*48 lethal 2.75" aerial rockets can be delivered by the XM3 kit mounted on production UH-1D.



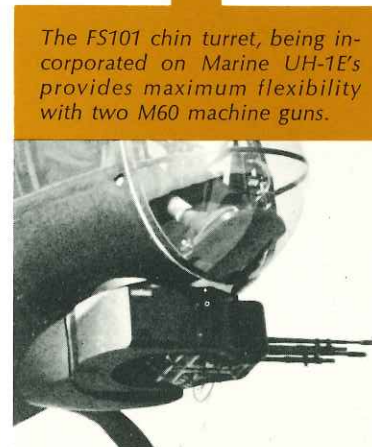
Both the M61 (shown) and the M24A1 20mm cannons have been fired from the UH-1's universal hardpoints by the Army/Bell team.



The Bell UH-1 with the M22 (SS-11 Missiles) is the standard anti-tank armed helicopter weapons system in the U. S. Army.



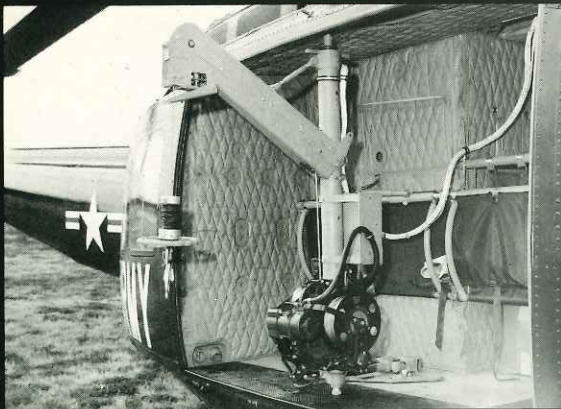
The XM20 7.62mm Minigun turret, now in development, provides a high rate of suppressive fire.



The FS101 chin turret, being incorporated on Marine UH-1E's provides maximum flexibility with two M60 machine guns.

\*Fully Qualified on UH-1D

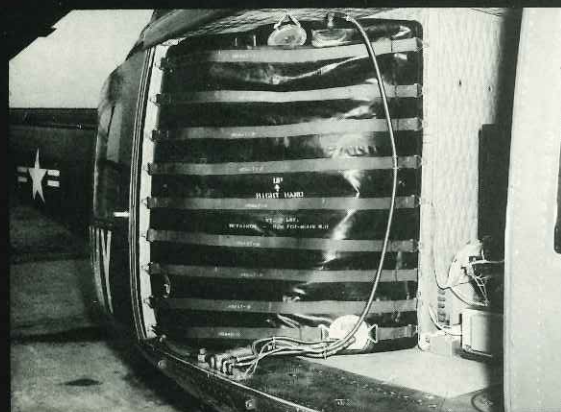




Plug-in 600 pound capacity rescue hoist, plus auxiliary fuel tanks provides a 7 hour search and rescue mission.



The UH-1D easily adapts to an aerial command post for effective communications and control.



150 gallon collapsible fuel tanks fit neatly on either or both sides of the UH-1D aft cabin.



Change from skid to float gear and the Delta becomes amphibious.



Snow shoes (skis) were developed and qualified on UH-1D in Arctic operations for landing on soft snow.



Liquid main and tail rotor anti-icing system is fully qualified through exhaustive testing.



The 60 gallon external tank attaches to the same standard hard-points used for armament.



Powered by the helicopter's electrical system, the portable ground handling wheels allow one man to move the helicopter in the field.

**KITS**

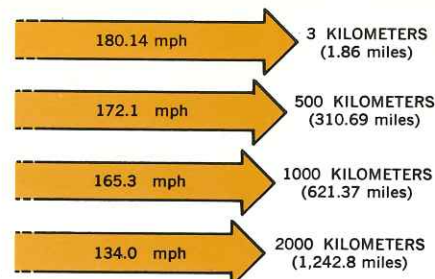




# UH-1D SETS 21 WORLD RECORDS

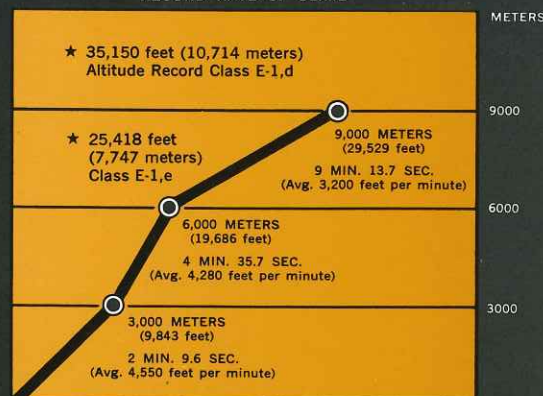
More Than Any Tactical  
Aircraft Has Ever Held

## SPEED RECORDS (4 of 12)

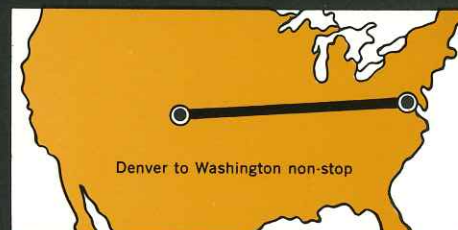


Plus 8 other equally outstanding marks.

## RECORD RATE OF CLIMB



## CROSS COUNTRY



## OVERSEAS



U. S. to Europe via Azores or Greenland and Iceland

## ■ SPEED RECORDS

In setting speed records, the Iroquois proved its reserve dash capability for surprise assault tactics . . faster mission response . . evasive action.

These achievements are a tribute to the skill of Army pilots and demonstrate Bell's unique capability to design and produce military helicopters of unequalled performance.

## ■ ALTITUDE AND RATE OF CLIMB

During record flights in late 1964, an Army pilot took the UH-1D up to 35,150 feet . . one mile higher than Mount Everest . . almost four miles higher than Pikes Peak. The UH-1D also set three new marks in rate-of-climb to altitude.

These records demonstrate the Delta's tremendous performance in reserve to climb and maneuver at all operational altitudes.

## ■ DISTANCE RECORDS

U. S. Army pilots of the Army Aviation Test Activity flying for the record have matched their skill to the Iroquois performance capabilities, setting new marks for both closed circuit (1,614.6 miles) and straight line (1,348.8 miles) categories.

In terms of tactical measures of performance, these runs demonstrate ferrying capabilities of the UH-1D . . for trans-ocean or extended cross-country deployment.





The four-bladed rigid rotor (shown) is one of several rotors which have been flight-tested on the UH-1 High Performance Helicopter. It has flown 250 mph in level flight with standard UH-1 rotor hub.



## RESEARCH

Bell Helicopter Company has long been one of the forerunners in research and development of new and improved products in VTOL and related fields.

Recent R&D projects include Bell's modified UH-1B high performance compound helicopter, the armed Sioux Scout, a twin engine UH-1 and several types of advanced rotor systems.

Equipped with wings and auxiliary jet engines, the streamlined UH-1B has flown at 250 miles per hour in level flight (first helicopter to exceed 200 knots in the history of aviation) and is collecting valuable data for application to future military and commercial helicopter designs.

Important information also is being assembled from tests conducted with the "Sioux Scout," a flying research test bed for refining ideas in the spectrum of potential helicopter weapons systems.



The Continental T67 twin engine package in development flight test offers 1400 HP and increased mission reliability for the UH-1.



The Dynamic simulator permits qualitative analysis of human response to the experimental visual instrument displays under test for the JANAIR program.



# AND DEVELOPMENT

The Model 540 or "door hinge" rotor system, featuring improved performance, low aerodynamic drag, high maneuverability and reduced maintenance was designed and developed by Bell for the UH-1. It is currently in production for the UH-1B and UH-1E.

Another current R&D project at Bell is the design for a new VTOL aircraft that could takeoff and maneuver like a helicopter and fly at jet aircraft speeds, with its rotors folded in a trailing position.

For several years, Bell has been the industry coordinator for the Joint Army/Navy Aircraft Instrumentation Research (JANAI) program testifying to its leadership in VTOL related electronics and instrument flight research. Through this program will come progressive advances toward an integrated instrument and control system and a true all visibility capability for VTOL aircraft.



With Bell's "Headtracker" weapons follow movement of gunner's head. Bell's eyeglass display projects a sighting ring in the gunner's field of vision.



The tandem, stepped-down seating of the Model 207 "Sioux Scout" gives both pilot and gunner maximum vision and equal target engagement capability.



Bell's "trailing rotor" design shown here could hover above 6,000 feet on a 95 degree day and fly at speeds over 500 miles per hour. No power is required for the conversion cycle which means autorotation landing would be possible in the event of total power failure.





# SERVING THE ARMED FORCES OF 18 NATIONS

- |             |                |                 |
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HELICOPTER** A **textron** COMPANY

POST OFFICE BOX 482 • FORT WORTH, TEXAS 76101

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MILITARY & COMMERCIAL HELICOPTERS

PRINTED IN U.S.A.